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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/066,095 | 01/31/2002 | Steven Teig | SPLX.P0074 | 6009 |

7590 12/15/2004
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| EXAMINER |
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BOWERS, BRANDON

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| ART UNIT | PAPER NUMBER |
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2825

DATE MAILED: 12/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/066,095

Applicant(s)

TEIG ET AL.

Examiner

Brandon W Bowers

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20040416, 20040518, 3/27/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Linsker, US Patent No. 4615011 in view of Varadarajan et al, US Patent No. 5838583.

In reference to claim 1, Linsker teaches a method comprising specifying a first total cost (Figure 6a, 324), performing a search to identify the set of paths that each have a cost that does not exceed the first total cost (Figure 6b, 436), and if the search cannot find the acceptable number of paths, incrementing the total cost and performing a second search to identify the set of paths that each have a cost that does not exceed the incremented total cost (Figure 6b, 444). Linsker does not teach wherein the searches are depth first and wherein each path in the set includes a set of expansions from the set of routable-element sources to the set of routable-element targets.

Varadarajan teaches a method comprising specifying a total cost (column 18, line 57 – column 19, line 10) and performing a depth-first search to identify the set of paths that each have a cost that does not exceed the total cost, wherein each path in the set includes a set of expansions from the set of routable-element sources to the set of routable-element targets (column 20, line 54 – column 22, line 11). Accordingly, it

would have been obvious for one skilled in the art at the time of invention to use the depth-first search as taught by Varadarajan with the total cost incrementer as taught by Linker to make a method comprising specifying a first total cost, performing a first depth-first search to identify the set of paths that each have a cost that does not exceed the first total cost, wherein each path in the set includes a set of expansions from the set of routable-element sources to the set of routable-element targets, if the search cannot find the acceptable number of paths, incrementing the total cost and performing a second depth-first search to identify the set of paths that each have a cost that does not exceed the incremented total cost because it would allow router to capture the hierarchical structure and regularity that was originally provided in the datapaths by the designer (Varadarajan – Column 1).

In reference to claims 2 and 3, Linker teaches that the number of acceptable paths is N(Figure 6a-b). Varadarajan teaches wherein the acceptable number of paths is user defined, but the optimal number is 4 (column 21, line 56 – column 22, line 11).

In reference to claim 4, Varadarajan teaches wherein the set of source routable elements includes one routable element (column 20, line 29 – column 22, line 19).

In reference to claim 5, Varadarajan teaches wherein the set of source routable elements includes more than one routable element (column 21, line 56 – column 22, line 11).

In reference to claim 6, Varadarajan teaches wherein the set of source routable elements include the routed routable elements (column 21, line 56 – column 22, line 11).

In reference to claim 7, Varadarajan teaches wherein the set of source routable elements further include elements on the routes between the routed routable elements (column 21, line 56 – column 22, line 11).

In reference to claim 8, Varadarajan teaches wherein the set of target routable elements includes one routable element (column 21, line 56 – column 22, line 11).

In reference to claim 9, Varadarajan teaches wherein the set of target routable elements includes more than one routable element (column 21, line 56 – column 22, line 11).

In reference to claim 10, Varadarajan teaches wherein the set of target routable elements include the routed routable elements (column 21, line 56 – column 22, line 11).

In reference to claim 11, Varadarajan teaches wherein the set of target routable elements further include elements on the routes between the routed routable elements (column 21, line 56 – column 22, line 11).

In reference to claim 12, Varadarajan teaches wherein the first total cost equals the distance between the set of source and target elements according to a particular interconnect-line model (column 18, line 57 – column 19, line 10).

In reference to claim 13, Varadarajan teaches wherein the routable elements are pins of the nets (Figure 2F)

In reference to claim 14, Varadarajan teaches wherein the routable elements are ports of the nets (Figure 2F)

In reference to claim 15, Varadarajan teaches wherein the method is used by a topological router that defines a plurality of topological items for defining each path, the method further comprising: defining each expansion to traverse from one topological item to another topological item (column 5, line 50 – column 6, line 19).

In reference to claim 16, Varadarajan teaches wherein the depth-first search is an A* search (column 19, line 12 – column 25, line 60).

In reference to claim 17-20, Varadarajan teaches examining 1 to X set of expansions to control the amount of depth of that is searched (column 22, lines 39-62)

In reference to claim 21, Varadarajan teaches wherein the first-set expansions are not examined in a particular order (column 25, lines 28-42).

In reference to claim 22, Varadarajan teaches wherein the first-set expansions are examined in a particular order (column 25, lines 28-42).

Conclusion

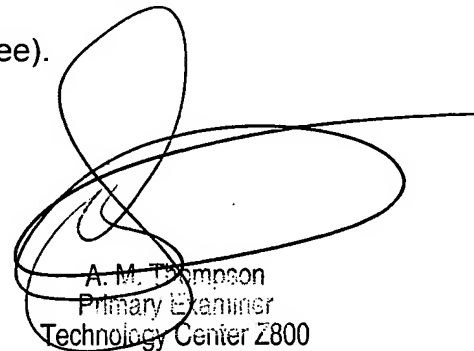
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandon W Bowers whose telephone number is (571)272-1888. The examiner can normally be reached on 8:30 am until 5:00 pm Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (571)272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2825

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BWB



A. M. Thompson
Primary Examiner
Technology Center Z800